

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Office Action dated December 2, 2011 has been received and its contents carefully reviewed.

The Applicants further thank the Examiner for taking the time to speak with Applicant's Representatives during the personal interview conducted on February 7, 2012. The substance of the interview is set forth in the Remarks and constitutes a record of the interview.

By this response, claim 1 has been amended to correct typographical errors and further define the invention. Claims 10 and 28 were previously canceled. Claims 8 and 9 are currently canceled without prejudice to or disclaimer of the subject matter contained therein. Claims 11-26 were previously withdrawn from consideration. Claims 29-30 are hereby added. No new matter has been added. Accordingly, claims 1-7 and 11-27, 29 and 30 are currently pending (with claims 11-26 being withdrawn). Reexamination and reconsideration of the pending claims are respectfully requested.

The claims are objected to. The Office Action states that “[i]t is respectfully pointed out that Applicant's original disclosure does not provide support for a ‘plated’ adhesion conductive layer.” *Office Action* at p. 2. Applicants respectfully disagree. As discussed during the interview, Applicants' specification discloses “[a] contact layer 50 is formed at the surfaces of the drain electrode 46 exposed via the first contact hole 47 and the pad 36 exposed via the second contact hole 49 preferably using an electric plating technique or a non-electrolytic plating technique.” *See Published Application* at ¶ [0027]. Therefore, Applicants respectfully assert that the original disclosure provides support for the “plated adhesion conductive layer,” recited in the claims. Accordingly, Applicants respectfully request that the Office withdraw the objection.

The Office Action rejects claims 1-9 and 27 under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art (hereinafter “APA”). *Office Action* at p. 4. As indicated on page 6 of the Office Action, the Examiner is actually rejecting claims 1-9 and 27-28 over APA in view of U.S. Patent No. 6,188,458 to Tagusa (“*Tagusa*”). Applicants respectfully traverse the rejection.

Claim 1 is allowable over the cited references in that claim 1 recites a combination of elements including, for example, “a second insulating layer on the third conductive layers and the first insulating layer, the second insulating layer having a first contact hole exposing a portion of the third conductive layers, and a second contact hole exposing the portion of the pad layer through the first and the second insulating layer; a first plated adhesion conductive layer located only on the area of the third conductive layer exposed by the first contact hole and a second plated adhesion conductive layer located only on the area of the pad layer exposed by the second contact hole on, wherein the first plated adhesion conductive layer is directly contacted with the third conductive layer and the second plated adhesion conductive layer is directly contacted with the pad layer, wherein the first and second plated adhesive conductive layers include a metal selected from the group consisting of Mo, Ni, Cr, Cu, Ag and Pb; a fourth conductive layer on the second insulating layer and the first plated adhesion conductive layer and electrically contacting a portion of a third conductive layer; a fifth conductive layer on the second insulating layer and the second plated adhesion conductive layer and electrically contacting the pad layer, wherein the first and second plated adhesion conductive layers are respectively contained within the first contact hole and in the second contact hole, wherein the width of the first plated adhesion conductive layer is identical with the width of the first contact hole and the width of the second plated adhesion conductive layer is identical with the width of the second contact hole.” None of the cited references, singly or in combination, teaches or suggests at least these features of the claim 1.

The Office purports that “APA discloses ... a pad layer (14A) on the substrate, ... the first insulating layer having a contact hole (above 14A) exposing a portion of the pad layer; (allowing electrical connection to 14A via contact hole above 14A); ... third conductive layers, (22A and 24A), ... the second insulating layer having a first contact hole exposing a portion of the third conductive layers (contact hole for pixel electrode) and a second contact hole (hole for 30) exposing the portion of the pad layer through the first insulating layer, a first adhesion conductive layer, 24B, on the exposed portion of a third conductive layer and a second adhesion conductive layer, 14B, on the exposed portion of the pad layer.” *Office Action* at pp. 4-5. Applicants respectfully submit that *APA* does not teach or suggest “a first contact hole exposing a portion of the third conductive layers, and a second contact hole exposing the portion of the pad layer through the first and the second insulating layer,” as suggested by the Office. The Office construes *APA*’s lower layer 24A of the drain electrode as the “third conductive layer,”

recited in claim 1 and construes *APA*'s lower layer 14A of the gate pad as the "pad layer," recited in claim 1.

Assuming *arguendo* that the Office's assertion is correct, *APA* does not teach or suggest a first contact hole exposing a portion of the lower layer 24A of the drain electrode and a second contact hole exposing the portion of the lower layer 14A of the gate pad, as suggested by the Office. *APA* discloses a contact hole for exposing the upper layer 24B of the drain electrode and a contact hole for exposing the upper layer 14B of the gate pad. See *Published Application* at ¶ [0008] and Figs. 1D-1E. Therefore, *APA* does not teach or suggest "a second insulating layer on the third conductive layers and the first insulating layer, the second insulating layer having a first contact hole exposing a portion of the third conductive layers, and a second contact hole exposing the portion of the pad layer through the first and the second insulating layer," as recited in independent claim 1.

The Office alleges that "Applicant's original disclosure does not provide support for a "plated" adhesion conductive layer" and "[t]herefore, 'plated' will be considered any structure wherein the adhesion conductive layer is directly adhered, by whatever means, to the underlying conductive layer." *Office Action* at p. 10. Applicants respectfully disagree.

As stated above, Applicants' specification discloses "[a] contact layer 50 is formed at the surfaces of the drain electrode 46 exposed via the first contact hole 47 and the pad 36 exposed via the second contact hole 49 preferably using an electric plating technique or a non-electrolytic plating technique." See *Published Application* at ¶ [0027]. Therefore, Applicants respectfully assert that the original disclosure provides support for the "plated adhesion conductive layer," recited in the claims.

Further, the claimed invention provides for many benefits and advantages, for instance, a contact layer that reduces a contact resistance with the transparent electrode material such that only a single metal layer with good conductivity can be used as electrodes where the contact layer includes a metal such as Mo, Ni, Cr, Cu, Ag or Pb formed at the surfaces of the drain electrode using a plating technique. See *Specification* at p. 6, lines 18-22, p. 7, lines 18-21, and at p. 8 line 9 - p. 8, lines 4-7. Therefore, "plated considered as any structure is directly adhered, by whatever means to the underlying conductive layer," as suggested by the Office, fails to teach or suggest the features of the claims.

The Office purports that the *APA* discloses "a first adhesion conductive layer, 24B, on the exposed portion of a third conductive layer and a second adhesion conductive layer, 14B, on the

exposed portion of the pad layer.” *Office Action* at p. 5. Applicants respectfully disagree. *APA* discloses that “a metal material is deposited onto the upper portion of the gate insulating film 16 provided with the active layer 18 and the ohmic contact layer 20 and then patterned, to form source and drain electrodes 22 and 24.” *See Specification* at p. 3, lines 7-9. Therefore, the drain electrode 24 including the lower layer 24A and upper layer 24B is formed by depositing a metal material and patterning the metal. Applicants respectfully assert that the drain electrode formed by patterning including a lower layer 24A and an upper layer 24B is not an adhesion conductive layer, as suggested by the Office. However, even if one of ordinary skill in the art construed the *APA*’s lower drain electrode 24B as the “first adhesion conductive layer” recited in claim 1, the *APA* still fails to teach or suggest “a first plated adhesion conductive layer located only on the area of the third conductive layer exposed by the first contact hole,” as recited in independent claim 1.

The claimed invention provides for many benefits and advantages, for instance, a contact layer that reduces a contact resistance with the transparent electrode material such that only a single metal layer with good conductivity can be used as electrodes. *See Specification*, at least, at p. 8 line 9 - p. 8, lines 4-7. Hence, the contact layer includes a metal such as Mo, Ni, Cr, Cu, Ag or Pb formed at the surfaces of the drain electrode using a plating technique. *See Specification* at p. 6, lines 18-22 and p. 7, lines 18-21. In contrast, *APA* discloses a drain electrode 24 including an lower layer 24A and an upper layer 24B formed by depositing a metal material and patterning the metal. *APA* is not concerned with a contact layer including a metal such as Mo, Ni, Cr, Cu, Ag or Pb formed at the surfaces of the drain electrode using a plating technique such that contact resistance is reduced and only a single metal layer with good conductivity can be used as electrodes.

Accordingly, *APA* does not teach or suggest “a first plated adhesion conductive layer located only on the area of the third conductive layer exposed by the first contact hole and a second plated adhesion conductive layer located only on the area of the pad layer exposed by the second contact hole on, wherein the first plated adhesion conductive layer is directly contacted with the third conductive layer and the second plated adhesion conductive layer is directly contacted with the pad layer, wherein the first and second plated adhesive conductive layers include a metal selected from the group consisting of Mo, Ni, Cr, Cu, Ag and Pb; a fourth conductive layer on the second insulating layer and the first plated adhesion conductive layer and electrically contacting a portion of a third conductive layer; a fifth conductive layer on the

second insulating layer and the second plated adhesion conductive layer and electrically contacting the pad layer, wherein the first and second plated adhesion conductive layers are respectively contained within the first contact hole and in the second contact hole, wherein the width of the first plated adhesion conductive layer is identical with the width of the first contact hole and the width of the second plated adhesion conductive layer is identical with the width of the second contact hole,” as recited in independent claim 1.

Further, the Office admits that *APA* “does not explicitly disclose an embodiment wherein the first and second adhesion conductive layers are respectively contained within the first contact hole and in the second contact hole.

Tagusa fails to cure the deficiencies of *APA*. The Office asserts that “*Tagusa* teaches ... a metal layer, 41 ... deposited such that it is exclusively and entirely contained [within] the contact hole, 26b.” *Office Action* at p. 5. Applicants disagree. *Tagusa* discloses “after the formation of the contact hole 26b, the cleaning solvent tends to permeate from the contact hole into the interface between the resin and the underlying transparent conductive film, causing the resin film to peel from the transparent conductive film” and “[i]n order to overcome this trouble ... the metal nitride layer 41 is formed on the transparent conductive film under the contact hole.” *Tagusa* at col. 12:16:23 and Figure 5. Therefore, *Tagusa* also applies the metal nitride layer 41 in the area outside of the contact hole at the interface between the resin and underlying transparent conductive film. In contrast, claim 1 recites “the first and second adhesion conductive layers are respectively contained within the first contact hole and in the second contact hole, wherein the width of the first plated adhesion conductive layer is identical with the width of the first contact hole and the width of the second plated adhesion conductive layer is identical with the width of the second contact hole.”

For at least these reasons, Applicants respectfully request that the Office withdraw the 35 U.S.C. § 103(a) rejection of independent claim 1. Claims 2-7 and 27 depend from independent claim 1. It stands to reason that the 35 U.S.C. §103(a) rejection of those dependent claims should be withdrawn as well.

New claims 29 and 30 are allowable for the same or similar reasons discussed above. Applicants submit claims 29 and 30 have been added to provide an additional scope of protection for the originally disclosed subject matter. These claims are allowable over any combination of *APA* and *Tagusa*.

Applicants believe the foregoing amendments and remarks place the application in condition for allowance and early, favorable action is respectfully solicited.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911.

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